I. Table of Contents (optional)

II. Title and Date

Field Inspection for the Red Hill Bulk Fuel Storage Facility
February 16, 2016

III. Background

The Red Hill Bulk Fuel Storage Facility (Facility) is an underground complex of 20 very large field constructed underground storage tanks (USTs), four large USTs, and associated piping and pumping equipment located near Pearl Harbor on the island of Oahu in Hawaii. The Facility is owned and operated by the U.S. Navy ("Navy") and was constructed from 1940 – 1943. The facility is located 2.5 miles west of Pearl Harbor. The USTs were constructed by tunneling into the volcanic mountain and constructing the tanks inside the mountain. This link provides a short history of the construction of the Facility: [HYPERLINK "https://www.youtube.com/watch?v=lIz8IstwnWU"]

Each of the 20 tanks at the Facility is approximately 250 feet high and 100 feet in diameter. The storage capacity of each tank is about 12.5 million gallons, for a total Facility capacity of about 250 million gallons. The tanks are constructed of 0.25 inch thick steel plates, welded together, and backed by a layer of concrete and rebar and the volcanic rock of the mountain. Each tank is connected to a pipeline which runs through an underground tunnel from the Facility to a fueling pier at Pearl Harbor. The tanks are oriented in two rows of ten tanks, numbered 1- 20.

Over its 70 year life, the Facility has stored a number of different types of fuel, including bunker fuel, aviation gasoline, motor gasoline, marine diesel, and jet fuel, to support military operations. The Facility currently stores marine diesel fuel, Jet Propulsion Fuel Number 5 (JP-5) and Jet Propulsion Fuel Number 8 (JP-8). Based on anecdotal information the Facility has experienced fuel releases in varying amounts from a number of tanks. These suspected releases have occurred since the Facility became operational in 1943.

On September 28, 2015, in response to releases from the Facility, Navy, Defense Logistics Agency ("DLA"), U.S. Environmental Protection Agency ("EPA") and Hawaii Department of Health ("DOH") entered into an enforceable agreement, also known as an Administrative Order on Consent under Section 7003 of the Resource Conservation and Recovery Act. The primary objectives of the Administrative Order on Consent are to take steps to ensure that the groundwater resource in the vicinity of the Facility is protected and to ensure that the Facility is operated and maintained in an environmentally protective manner. In addition, EPA made revisions to the 1988 UST regulation and the state program approval regulation under 40 Code of Federal Regulations ("CFR") Parts 280 and 281, which contains additional applicable requirements for the Facility.

IV. Scope or Objective Statement

Due to the complexity, structure, size, location, and specialized equipment at the Facility, developing a comprehensive baseline inspection and routine regulatory inspection procedure are exceptionally challenging. This contract requires specialized expertise in the following areas:

1) Single and secondary containment systems for large USTs with volumes over

500,000 gallons of petroleum;
2) Industry best practices for constructing, operating, and maintaining large field-constructed USTs;
3) Structural engineering of large steel vessels and concrete containment structures;
4) Knowledge of 40 CFR Parts 280 and 281;
5) Operator training requirements for operating large field-constructed UST facilities;
6) Release detection techniques, programmable logic controllers and methods for detecting releases from large field-constructed USTs and piping;
7) Extensive knowledge of American Petroleum Institute (API) Standards including, at a minimum, API 653, 650 and 579;
8) Extensive knowledge of steel plate welding methods for large steel vessels;
9) Recordkeeping procedures for large field-constructed USTs and associated piping and pumping equipment;
10) Recordkeeping procedures for petroleum depot facilities;
11) Walkthrough inspection procedures for UST facilities;
12) Industry inspection procedures for large field-constructed USTs associated piping and pumping equipment; and
13) Knowledge of writing and documenting standard operating procedures to guide future field inspections at the Facility.

The contractor will be required to assist EPA with conducting and documenting a thorough baseline inspection for the field-constructed USTs, piping, associated equipment and fuel handling computer systems at the Facility. The baseline inspection procedure will be used by implementing Regulatory Agencies to assess the Facility's current condition and for future routine inspections. In addition, the contractor shall use results from the baseline inspection to recommend areas for further inspection and draft options for ongoing routine regular inspections.

The contractor shall have working knowledge of current industry best practices for operating and maintaining large field-constructed USTs and petroleum depot facilities. The contractor shall have experience operating, maintaining, managing or inspecting, or being a member of a team which conducted such activities at large field-constructed USTs and petroleum depot facilities. The contractor shall also have knowledge of best practices and methods to record and maintain records related to the operation, maintenance and inspection of large field-constructed USTs and petroleum depot facilities

The contractor shall have knowledge of the structural engineering principles associated with the aforementioned infrastructure at the Facility. This includes knowledge of steel and concrete containment structures and vessels, and, in particular, large concrete containment structures lined with carbon steel. In addition, the contractor shall have knowledge of the structural engineering principles and materials associated with extensive petroleum piping networks. The contractor shall have knowledge to determine the integrity of vessel and piping structures and methodologies to detect releases from them.

The contractor shall have knowledge of the various State and Federal regulations that apply to the Facility. The contractor shall also be certified in, or have extensive knowledge of, at least one or more API standards for large containment vessels. The contractor shall be familiar with how

API standards will effect maintenance and operation of field-constructed USTs, piping and associated equipment.

V. Task Description(s)

1. Project Management

The contractor shall identify the individuals and/or principles assigned to this contract. The resumes or curriculum vitae shall be included for each individual. After the contractor has assigned the appropriate personnel to the contract, EPA and the contractor shall have an initial meeting to discuss the scope of the work assigned and a subsequent planning meeting. The contractor shall have at least monthly conference calls with EPA to discuss the scope of the field inspection. These monthly conference calls may be waived by EPA staff, depending on the status of work being performed for the tasks described below.

2. Navy Operation Evaluation

Navy and DLA have been operating the Facility for over 70 years and have extensively modified their operation and maintenance over that period. The contractor will be required to review existing documentation regarding the condition and construction of Facility equipment and infrastructure, as well as failure modes and release history at the Facility. The contractor will also be required to examine current operating procedures, fuel handling systems, and documentation and training provided to fuel operators and maintenance staff at the Facility for suitability. The contractor will also be required to evaluate records and recordkeeping procedures at the Facility. All documents will be provided by EPA to the contractor. The contractor will not be required to search for records.

We estimate that the contractor document review will take approximately 60 hours.

3. Thorough Baseline Inspection

Following the review of Navy documentation in Task 2, the contractor will conduct a thorough baseline facility inspection. The facility, which is part of the Joint Base Pearl Harbor-Hickam, requires all personnel accessing the facility to be cleared by the Navy for access, and requires a Navy escort at all times within the facility. Due to the complexity, structure, size, location, and specialized equipment at the Facility, developing a comprehensive field inspection procedure requires acknowledgement of the unique conditions at the facility. Facility conditions restrict wireless communication and photography must be approved by Navy personnel.

The baseline inspection will include touring the Facility, interviewing key Facility personnel, examining Facility equipment and infrastructure, observing operating practices and management systems, and additional analysis determined to be essential by the contractor. The contractor shall be able to quickly articulate issues related to inspection and recordkeeping requirements and justify basis for these requirements for EPA and DOH during discussions with Navy and DLA personnel.

The baseline inspection shall provide an overall assessment of the Facility's ability to be operated in a manner that prevents release of fuel into the environment. The contractor shall document the results of the baseline inspection. The records and results of the baseline inspection

should be able to adequately describe the Facility's physical condition, along with the safety and adequacy of fuel handling operations compared to other petroleum depot facilities.

We estimate that the thorough baseline inspection will take approximately **80** hours.

4. Baseline Inspection Report and Routine Regular Inspection Procedure

The contractor shall submit a *Baseline Inspection Report* that will detail the results of the baseline inspection conducted at the Facility. The *Baseline Inspection Report* shall include, at a minimum, an executive summary, a description of the Facility, results of the baseline inspection, and recommended areas for further detailed inspection.

In addition, the contractor shall develop several options for routine regulatory inspection procedures that will help determine whether the Facility is in compliance with new state and Federal regulations. The routine regulatory inspection procedure for the Facility shall encompass the field-constructed USTs, associated piping and pumping equipment, owner and operator qualification requirements, recordkeeping, as well as any other associated infrastructure.

The contractor shall submit these options for routine regulatory inspection procedures to EPA for review.

We estimate that developing the *Baseline Inspection Report* and the options for routine regulatory inspection procedures will take XX hours.

VI. Milestones and Deliverables

Task	Deliverable	Due
1.	Scoping Meeting	Within 10 days of receiving SOW
	Project Plan	Within 10 days of the scoping meeting
	Monthly Status Calls	TBD
2.	Navy Documentation Review Summaries	TBD
3.	Conduct Baseline Inspection	TBD
4.	Baseline Inspection Report	TBD
	Options for Routine Regulatory Inspection	TBD

All tasks shall be completed by September 30, 2016.